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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

PHYSICS 11.: CIRCULAR MOTION

DPP No. : 1

1. A particle moving along a circular path due to a centripetal force having constant magnitude is an example of motion with :

(1) constant speed and velocity

(2) variable speed and velocity

(3) variable speed and constant velocity

(4) constant speed and variable velocity.

2. The breaking tension of a string is 10 N. A particle of mass 0.1 kg tied to it is rotated along a horizontal circle of radius 0.5 metre. The maximum speed with which the particle can be rotated without breaking the string is-

(1) $\sqrt{5}$m/sec (2) $\sqrt{(50)}$ m/sec (3) $\sqrt{(500)}$ m/sec (4) $\sqrt{(1000)}$ m/sec

3. If the radii of circular paths of two particles of same masses are in the ratio of 1 : 2, then in order to have same centripetal force, their speeds should be in the ratio of :

(1) 1 : 4 (2) 4 : 1 (3) 1 : $\sqrt{2}$ (4) $\sqrt{2}$: 1

4. The second's hand of a watch has length 6 cm. Speed of end point and magnitude of difference of velocities at two perpendicular positions will be :

(1) 2π & 0 mm/s (2) $2\sqrt{2}\ \pi$ & 4.44 mm/s

(3) $2\sqrt{2}\ \pi$ & 2π mm/s (4) 2π & $2\sqrt{2}\ \pi$ mm/s

5. A car is travelling with linear velocity v on a circular road of radius r. If the speed is increasing at the rate of 'a' metre/sec^2, then the resultant acceleration will be -

(1) $\sqrt{\left[\frac{v^2}{r^2}-a^2\right]}$ (2) $\sqrt{\left[\frac{v^4}{r^2}+a^2\right]}$

(3) $\sqrt{\left[\frac{v^4}{r^2}-a^2\right]}$ (4) $\sqrt{\left[\frac{v^2}{r^2}+a^2\right]}$

6. The circular motion of a particle with constant speed is -

(1) periodic and simple harmonic

(2) Simple harmonic but not periodic

(3) Neither periodic not simple harmonic

(4) periodic but not simple harmonic

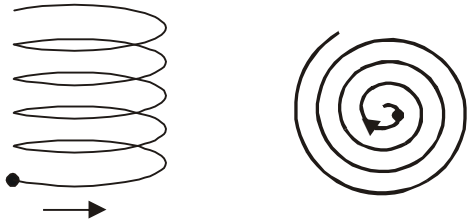
7. A 500 kg car takes around turn of radius 50 m with a speed of 36 km/hr. The centripetal force acting on the car will be :

(1) 1200 N (B) 1000 N (3) 750 N (4) 250 N

8. A body is moving in a circular path with acceleration a. If its velocity gets doubled, find the ratio of acceleration after and before the change :

(1) 1 : 4 (2) $\frac{1}{4}$: 1 (3) 2 : 1 (4) 4 : 1

9. A particle is going with constant speed along a uniform helical and spiral path separately as shown in figure



(1) The velocity of the particle is constant in both cases

(2) The magnitude of acceleration of the particle is constant in both cases

(3) The magnitude of accleration is constant in (a) and decreasing in (b)

(4) The magnitude of accleration is decreasing continuously in both the cases

10. A stone tied to a string of length L is whirled in a vertical circle with the other end of the string at the centre. At a certain instant of time the stone is at its lowest position and has a speed u. The magnitude of the change in its velocity as it reaches a position, where the string is horizontal, is

(1) $\sqrt{u^2 - 2gL}$ (2) $\sqrt{2gL}$ (3) $\sqrt{u^2 - gL}$ (4) $\sqrt{2(u^2 - gL)}$